

ABSTRACT OF THE DISCLOSURE

An optical imaging system is provided that includes a rod lens array and has the optimum refractive index distribution for achieving a high
5 resolving power. The refractive index distribution of rod lenses can be expressed by

$$\text{Eq. 45 } n(r)^2 = n_0^2 \cdot \{1 - (g \cdot r)^2 + h_4 \cdot (g \cdot r)^4 + h_6 \cdot (g \cdot r)^6 + h_8 \cdot (g \cdot r)^8\}$$

10 where r is a radial distance from the optical axis of the rod lenses, n_0 is a refractive index on the optical axis of the rod lenses, and g , h_4 , h_6 and h_8 are refractive index distribution coefficients. The refractive index distribution coefficients h_4 , h_6 and h_8 are set on a spheroid in a Cartesian coordinate
15 system with h_4 being x -axis, h_6 being y -axis and h_8 being z -axis. The spheroid is defined by a vector X^* that is expressed by

$$\text{Eq. 46 } X^* = (x, y, z) = O^* + k_A A^* + k_B B^* + k_C C^*$$

20 where O^* is a vector from the origin of the Cartesian coordinate system to the center of the spheroid, A^* , B^* and C^* are vectors in the directions of the major axis, the mean axis and the minor axis of the spheroid, respectively, and k_A , k_B and k_C satisfy $k_A^2 + k_B^2 + k_C^2 \leq 1$.